

Summary of Navajo NM GRI meeting June 25th and 28th, 2001

Summary

A geologic resources inventory workshop was held for Navajo NM (NAVA) on June 25th and 28th, 2001 to view and discuss the park's geologic resources, to address the status of geologic mapping for compiling both paper and digital maps, and to assess resource management issues and needs. Cooperators from the NPS Geologic Resources Division (GRD), NPS Navajo NM, Colorado State University, University of Wyoming and United States Geologic Survey (GS) were present for the workshop. This was part of a multi-park scoping session also involving Petrified Forest NP, Pipe Spring NM, Sunset Crater NM, Wupatki NM, and Walnut Canyon NM.

On Monday June 25th, scoping involved a half-day field trip to view the geology of the Navajo NM Betatakin Ruin area led by Sherrie Landon (University of Wyoming). Additionally, on June 28th another half-day scoping session to present overviews of the NPS Inventory and Monitoring (I&M) program, the Geologic Resources Division, and the on-going Geologic Resources Inventory (GRI) took place. Round table discussions involving geologic issues for Navajo NM included interpretation, natural resources, the status of geologic mapping efforts, sources of available data, geologic hazards, and action items generated from this meeting.

Currently, the greatest issue facing park resource management is dealing with the potential threats of resource loss from fractures in the alcove ruins that are causing geologic rockfall and collapse. Because of this, it is desired to increase the scale of existing geologic maps of the area from 1:125,000 scale to larger 1:24,000 scale as it would aid in defining areas at highest risk to resource damage.

For a list of meeting attendees, see **Appendix A (*List of Attendees for Geological Resources Inventory Workshop, June 25-29, 2001*)**

Geologic Mapping

George Billingsley (USGS-Flagstaff, AZ) informed the scoping participants of an existing USGS publication that contains geologic maps covering Navajo NM. (Cooley, M.E., Harshbarger, J.W., Akers, J.P., Hardt, W.F., and Hicks, O.N., 1969, *Regional hydrogeology of the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah*: U.S. Geological Survey, Professional Paper 521-A, scale 1:125,000).

Unfortunately, these maps are small scale and not necessarily conducive to resource management goals. Additionally, the maps are not on a topographic base. Thus larger scale mapping on a topographic base is desirable for the six quadrangles of interest to NAVA. NAVA contains 3 separate units totaling approximately 500 acres. The quadrangles of interest are as follows:

- Tall Mountain
- Keet Seel Ruin
- Inscription House Ruin
- Shonto NW

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- Betatakin Ruin
- Marsh Pass

Sherrie Landon (NAVA-GIP, University of Wyoming), through her work as a volunteer geologist-in-the-park at NAVA and her graduate studies at the University of Wyoming, is interested in doing the large scale mapping for the park. This could probably be funded through a contract or an EDMAP project through her university. It was agreed that she is the most likely person to be able to complete this geologic mapping for NAVA because of her experience in the area and her interest in seeing the project completed. This needs follow-up through GRI staff.

It would be most desirable to have the entire six quadrangles mapped, but that will likely be costly and time consuming. Thus, if the three separate units were mapped in detail to the park boundary, it might suffice in the interim. A scale of 1:24,000 is considered the minimum acceptable scale for any new mapping of the area. Given the size of the monument, perhaps even larger scale 1:12,000 mapping would be best.

Digital Geologic Map coverage

At present, a digital coverage of the 1969 maps has not been found. However, George Billingsley has heard rumors from a Navajo Nation representative that those geologic maps had been digitized, but he is not sure of the source. This information will try to be located as there are numerous sheets, and it would be redundant to re-digitize these maps if the effort has already been undertaken. Tim Connors will attempt to discern if this information is available digitally from the Navajo Nation.

In the event that digitized versions of the existing maps are not found, and until new larger scale mapping can be accomplished for the NAVA area, it is suggested that the existing 1:125,000 scale maps be scanned, registered, rectified and digitized (if necessary) for use in a GIS. While the scale is crude, it can serve as the best "preliminary" baseline geologic map until new, larger scale mapping is completed.

If the mapping for NAVA is completed at the larger scale, it would also be digitized as per the NPS Digital Geologic Map model as demonstrated during the scoping sessions.

Other desired GIS data

Since NAVA does not have a full-time dedicated GIS person at the park, they are dependent on the Intermountain Region GIS staff in Denver for support. They have been receiving assistance to date from Jennifer McCollum.

Miscellaneous Items of interest

- Many of the park trails have had problems with rockslides in the recent past and Betatakin Trail has had to limit hikers because of this problem. A geologic map should help delineate these troublesome areas in the monument.
- Another resource management issue is the effect of deeper canyon cutting in the monument. Arroyo cutting is effecting tributaries and cultural resources (middens)

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are being washed away and destroyed. According to George Billingsley, Margaret Hiza (USGS-Denver) is currently working with the Navajo Nation on erosion issues and the park may want to contact her for assistance.

- The nearby Black Mesa Coal Mine is interested in pumping more water from the regional aquifer for their industrial uses. This could negatively effect park water quantity and is thus a pressing issue at the current time.
- Current natural resource staff at Navajo NM are Irv Francisco, Kevin Harper, and Brenton White.

Appendix A: List of Attendees for Geological Resources Inventory Workshop

June 25-29, 2001

NAME	AFFILIATION	PHONE	E-MAIL	Navajo 6-25	Grand Canyon 6-26	Petrified Forest 6-27	Flagstaff 6-28	Wupatki- Sunset Crater 6-29
John Graham	Colorado State University	970-225-6333	Jpgraham250@msn.com	X	X	X	X	X
Tim Connors	NPS, GRD	303-969-2093	Tim_connors@nps.gov	X	X	X	X	X
Sherrie Landon	NAVA	307-755-1336	Slandon@uwyo.edu	X	X			
Brenton White	NPS, NAVA	520-672-2720	Brenton_White@nps.gov	X				
Kevin Harper	NPS, NAVA Archeologist	520-672-2720	Kevin_harper@nps.gov	X				
James Charles	NPS, NAVA Superintendent	928-672-2700	James_charles@nps.gov	X			X	
George Billingsley	USGS	928-556-7198	Gbillingsley@usgs.gov		X	X	X	
Della Snyder	NPS, GRCA	928-226-0163	Della_snyder@nps.gov		X			
Allyson Mathis	NPS, GRCA Interpretation	520-638-7955	Allyson_mathis@nps.gov		X			
Debra Block	USGS	928-556-7138	Dblock@usgs.gov		X			
Jessica Wellmeyer	USGS	928-556-7267	Jwellmeyer@hotmail.com		X			
John Rihs	NPS, GRCA Hydrologist	520-638-7905	John_rih@nps.gov		X			
Scott Graham	USGS	928-556-7270	Sgraham@usgs.gov		X		X	
Tracey Felger	NPS, GRCA GIS	520-556-7164	Tracey_felger@nps.gov		X		X	
Bill Parker	PEFO Paleontologist		William_parker@nps.gov			X	X	
Karen Beppler	NPS, PEFO	928-624-6228, ext. 263	Karen_beppler@nps.gov			X	X	
Sid Ash	PEFO	505-856-5852	Sidash@aol.com			X	X	
Sue Clements	NPS, PEFO		Tecumseh@selway.umn.edu			X	X	
Sarah Hanson	SUCR GIP	520-526-0502 517-264-3944	Slhanson@adrian.edu				X	X
Dave Sharrow	NPS, PISP	435-644-4318	Dave_sharrow@nps.gov				X	
Helen Fairley	NPS, Flagstaff Area	928-526-1157	Helen_fairley@nps.gov				X	X
Michael Ort	Northern Arizona University	928-523-9363	Michael.ort@nau.edu				X	
Nicole Tancreto	NPS, Flagstaff	928-556-7466, ext. 240	Nicole_tancreto@nps.gov				X	
Paul Whitefield	NPS, Flagstaff area parks	928-526-1157	Paul_whitefield@nps.gov				X	X
Ron Hiebert	NPS, NAU-CESU	520-523-0877	Ron.hiebert@nau.edu				X	
Todd Metzger	NPS, Flagstaff		Todd_metzger@nps.gov				X	